● PRINTER RUSH ●
(PTO ASSISTANCE)

Application : 09/701514 **Examiner :** Natnael **GAU :** 2614

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[RUSH] **MESSAGE:**

Spec page 5 is illegible. Please provide clear copy.

Thank you

[XRUSH] **RESPONSE:** OK, rec'd

1/31/06 [illegible]

INITIALS: TA

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• a scenario-specific perceptual layer 40.

An auditory sensory layer model component 10 comprises an input 11 for the audio stimulus, which is provided to an auditory sensory layer model 12. The auditory model 12 measures the perceptual importance of the various auditory bands and time elements of the stimulus, and generates an output 16 representative of the audible error as a function of auditory band (pitch) and time. This audible error may be derived by comparison of the perceptually modified audio stimulus 13 and a reference signal 14, the difference being determined by a subtraction unit 15 to provide an output 16 in the form of a matrix of subjective error as a function of auditory band and time, defined by a series of coefficients E_{da1}, E_{da2}, ..., E_{dan}. Alternatively the model may produce the output 16 without the use of a reference signal, for example according to the method described in international patent specification number WO96/06496.

A similar process takes place with respect to the visual sensory layer model 20. However, in this context a further step is required. The image generated by the visual sensory layer model 22 is analysed in an image decomposition unit 27 to identify elements in which errors are particularly significant, and weighted accordingly, as described in international patent specification number WO97/32428. This provides a weighting function for those elements of the image which are perceptually the most important. In particular, boundaries are perceptually more important than errors within the body of an image element. The weighting functions generated in the weighting generator 28 are then applied to the output 26 in a visible error calculation unit 29 to produce a "visible error matrix" analogous to that of the audible error matrix described above. The matrix can be defined by a series of coefficients E_{dv1}, E_{dv2}, ..., E_{dvn}. Images are themselves two-dimensional, so for a moving image the visible error matrix will have at least three dimensions.

see attached page

It should also be noted that the individual coefficients in the audible and visible error matrices may be vector properties.

There are a number of cross-modal effects which can affect the perceived quality of the signal. The effects to be modelled by the cross-modal model 30 may include the quality balance between modalities (vision and audio) and timing effects correlating between the modalities. Such timing effects include sequencing

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An input 21 for the visual stimulus is provided to a visual sensory layer model 22, which generates an output 26 representative of the visible error. This error may be derived by comparison of the perceptually modified visual stimulus 23 and a reference signal 24, the difference being determined by a subtraction unit 25 to provide an output 28 in the form of a matrix of subjective error, defined by a series of coefficients E_{dv1}, E_{dv2}, ..., E_{dvn}.

E_{dv1} E_{dv2} E_{dvn}